

WARWICKSHIRE

Industrial Archaeology Society

WIAS

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FROM THE CHAIRMAN

'Here, there and everywhere'

An investigation of, and concern for, the industrial heritage has progressed over time, it has become clear that items of interest can be discovered in less likely locations. One example of this has been the surge of interest in the technology and industrial heritage contained within our country houses. As well as the architecture, art, furnishing, gardens and landscapes of these houses, they also contain examples of water supply, heating, internal communication and lighting developed as a result of technical innovation during the 19th century and beyond. Located far from urban centres and possible links to central sources of supply, they needed to develop systems of their own.

The remaining examples of such developments have been a focus of recent work by Professor Marilyn Palmer MBE and Dr. Ian West at the University of Leicester, celebrated by their publication of *'Country House Technology'*. In parallel, 'Heritage of Industry' has been running a series of regional tours – *'Country House Comfort and Convenience'* - to explore these items on site. Forthcoming 2017 tours include The Welsh Borders 24th-27th April; The South West 26th-29th June; Northern Ireland 7th-11th August; and The North East and Scottish Borders 4th-8th September. Full details from www.heritageofindustry.co.uk

Heritage of Industry also runs tours abroad, and several members of WIAS have participated in these tours. For most of us, however, we are often not able to make such a specific choice, and trips abroad tend to be with family and friends. Attempting to persuade others of the potential attraction of industrial sites, and to allocate time from a busy holiday schedule to such

visits has its difficulties, but there is usually something for everyone to enjoy.

A case in point is a recent trip to the Deep South of the United States of America, and I was able to give a presentation to WIAS as part of the November meeting. The visit came very close to the 2016 Election and so it was a fascinating time to be in this part of the world, and to observe the past - and current - economic, social and political make-up of the region. Enthusiasts for the origins of country, blues, jazz and rock-n-roll had plenty to keep them occupied as well, but the area also generated a surprising amount for those with an interest in the industrial heritage.

Cotton, of course, was the life-blood of the Deep South and is intimately linked with the economic and social history of the region as well as the history of slavery, racial conflict, the Civil War, and the Civil Rights Movement (so effectively displayed in the Civil Rights Museum in Memphis). Remembering all those lessons received (and delivered) on the English industrial revolution, the starting point was often the arrival of cotton in Liverpool and (inevitably) the emphasis was on technological change and mill development in Lancashire and elsewhere in the UK. What the visit to the Deep South taught me was that this, in a sense, was just the tail-end of the story. What lay behind was not only the nature of the production of raw cotton, but the hugely important trading system that linked the UK, West Africa and the Deep South itself - occurring at a time when sail was the motive power, and the written or spoken word was the only means of communication. There are many aspects of this trade that are difficult for us to accept, but the lasting impact on the production of cotton in America is still to be seen.

I had never seen a field of cotton before, and I greeted my first

viewing - just off Highway 61 'The Blues Highway' - with almost boyish enthusiasm. I spoke to local farmers about the harvesting process, and they were similarly rather surprised by my obvious excitement. Further research revealed that one of the plantations - Frogmore, near Natchez - had been established as a museum. Fortunately this was on our route and we were fascinated to hear the history of that plantation, but also to witness the application of steam technology to the ginning process, with an 1880s Robert S. Munger gin that utilised steam power for suction purposes.

This was supplemented by a visit to the Memphis Cotton Exchange (now a museum) illustrating the development of the trading systems based on the telegraph and observation of (and a trip on) the Mississippi paddle steamer, now laden with tourists, but previously (often) overladen with bales of cotton.

Cotton was only one aspect of the trip but I hope it reveals that wherever we go there are items of interest for the industrial archaeologist, and I am pleased to report that when pressure of time meant that we had to choose between Elvis Presley's Graceland and The Memphis Cotton Exchange, the latter won the vote!

PROGRAMME

9 February 2017

Paul Baker:

The Lost Railway: Lapworth to Henley in Arden.

9 March 2017

John Frearson:

Nelson's and Kaye's: two Warwickshire Cement Companies.

13 April 2017

Richard Williams:

The Immense historical significance of the Cast Iron Cooking Pot.

11 May 2017

Chairman's Evening:

An Evening of Short Presentations Co-ordinated by Martin Green.

8 June 2017

David Hulse:

Thomas Newcomen and the Engine that Changed the World.

NEWSLETTER

Meeting Reports

October 2016: Yvonne Jones:

An Art of Great Importance to Commerce: the Midland's Japanned Tin and Papier Mâché Industry of the 18th and 19th Centuries.

Report by Martin Green

The society was extremely fortunate to have Yvonne Jones – the leading expert in this field – to talk on the subject of Japanning at the October meeting. As well as delivering a fascinating history with excellent illustrations, she also brought physical examples of the work of Japanners, and the copy of her magnificent book on the subject 'Japanned Papier mâché and tinware 1740-1940'. In the preface to that book, she writes "*Some years ago, whilst cataloguing and managing the collection of japanned papier mâché and tinware at Wolverhampton Art Galleries and Museums, it became clear how few publications were there to help me. New to the subject and with none of the existing literature answering all my questions, the only way forward was for me to find out for myself, with no notion of the scale of the task, or, indeed, where the research might lead.*"

She need not have worried - her presentation revealed that the research had led to the development of unrivalled knowledge of this Midlands industry, and members greatly enjoyed the opportunity to learn about this little-known (mainly) Midland trade.

Japanning was the process of varnishing and decorating tin-plated iron and papier mâché (and a selection of other products as well). To achieve the hard lustrous surface which so characterises japanned ware, each layer of varnish had to be gently baked and stove-dried before the next was added. It had to be undertaken in workshops that were free from dust, smoke and moisture, and the hot, odorous atmosphere was a challenge to the uninitiated. There were, of course, various differences in the layers applied, beginning with the ground layers applied in the blacking shop, through to the final layers of (various types of) decoration. The latter might include tortoiseshell effects, pearl decoration, painted decoration, printed decoration, gilding or bronzing, as well as the necessary varnishing and finishing to conclude the process.

Japanning is in some respects a misleading term, as it often referred to techniques utilised in the production of goods made in China and India as well as Japan, later to be copied by industrialists in the UK, including Wales, the Midlands and London. The ancient skill of lacquering is a long and complex procedure, requiring layer upon layer of natural varnish for true Chinese or Japanese lacquer, whilst the Indians developed their own resin lacquer. Mrs Jones illustrated the supreme quality of these imports with pictures of The Mazarin Chest, Japan, c 1640 and a Bureau-cabinet of black-lacquered wood with gold lacquer decoration made in Canton, southern China in c 1730, both are in the Victoria and Albert Museum.

In the 1720s, workers at The Pontypool Ironworks seem to have been the first to develop a lacquering process that might bear comparison with Oriental imports, and some of the earliest Japanned ware is, therefore, from Pontypool - and is much prized by collectors. The first Midlands manufacturer to follow Pontypool's example was John Taylor of Birmingham, a leading enameller and gilt-button-maker who, in about 1740, added japanned tin snuff boxes

to his range of products. Once perfected, japan varnish could be applied to many other products as well – slate, copper, leather, and, in particular, papier mâché. Although they were frequently conducted under one roof, tinplate working and papier mâché were two distinct trades, calling for different skills, and carried on independently within each establishment, the products of each coming together only for the final process of japanning.

In terms of chronological development, what happened was that the Welsh japanning trade declined, and the Midlands trade – Wolverhampton, Bilston, Birmingham – expanded. Advantages for the Midlands included the ready supplies of raw materials, the development of a canal system centred on Birmingham and the Black Country, and a rapidly emerging reputation as an area for specialist metalworking skills. The list of Midland Japanners grew as did the pages of the catalogues of Japanned goods that were available. As one might expect from this innovative district, 'Midland Japanners rarely fought shy of attempting the impossible – there were few luxury objects or household items they were not prepared to make'.

Mrs Jones then went on to describe the contributions made by a number of Midland Japanners. As one might expect with the development of the product range, scale of operations also grew, and significant capital investment was made in creating suitable premises. Firms such as Henry Loveridge & Co. of Wolverhampton produced a wide range of goods to the highest standards, and established a worldwide reputation for the quality of output.

The papier mâché industry seems to have arrived in Birmingham in the 1760s and Henry Clay took out a patent in 1772 on a technique that produced a stronger and more versatile 'pasteboard' (principally by oiling and baking the paper). Simple products such as trays were initially manufactured, but the sophistication and range of papier mâché products developed over time (including furniture!). Birmingham became the centre of the papier mâché industry, with Clay and Jennens & Bettridge major players in that industry, with the latter employing 300-400 workers in the 1840s.

The Japanned tinware and papier mâché trades both declined quite rapidly in the latter part of the nineteenth century. By the 1860s, Japanners were beginning to feel the effects of the electro-plating trade, and few manufacturers survived successfully into the twentieth century, with the industry dying out in the 1930s. The luxury papier mâché market began to suffer from attempts to create even more elaborate designs, whilst keeping costs under control. Cheaper, inferior products began to emerge, and the fate of papier mâché was sealed.

Mrs. Jones then answered a range of questions, including some related to workshop conditions, the nature of the workforce, and any remaining evidence of Japanning premises in Birmingham, Bilston and Wolverhampton. In the end, the Chairman had to interrupt the flow of questions to allow Mrs. Jones the opportunity to get home! A hugely successful evening, greatly appreciated by all who were able to attend.

November 2016: Chris Barney

Report by Martin Green

The Work of the Association for Industrial Archaeology followed by a Report on the AIA Conference 2016.

Chris Barney, a long-serving member of the Association for Industrial Archaeology's Council, and currently the editor of the AIA Quarterly Newsletter - as well as sitting on the WIAS Committee - gave a presentation on the origins, work and future plans of the AIA.

The origins of concern for the industrial heritage had their beginnings in the inter-war period with the formation of such groups as The Newcomen Society (1920), and the Cornish Engine Preservation Committee (1935), together with the Society for the Preservation of Ancient Buildings undertaking surveys of historic bridges and of wind and watermills, whilst some industrial sites e.g. Ironbridge received protection as ancient monuments.

The Second World War then witnessed the destruction of a great many historic sites and the transformation of industry. But such losses and changes brought a new grassroots appreciation of heritage generally and industrial heritage in particular. The renewed transport of heavy commodities on the narrow boat canal system was short-lived and boating enthusiasts such as Tom Rolt fought hard to preserve access across the canal system in the face of Government closures. Eventually, the Inland Waterways Association, which had been formed in 1947, proved to be spectacularly successful and much of the canal system is now preserved for leisure activities. Indeed, a new charitable body, the Canals & Rivers Trust, has just been created to look after inland navigable waterways and British Waterways, the government agency, has been transferred to the CRT. Similarly, the closure of many railway lines led to the formation of numerous preserved railway societies which now operate over one thousand steam locomotives and are very effectively advised by the Heritage Railways Association.

The interest in industrial heritage fostered by the Workers' Educational Association in the 1950s spawned numerous local industrial archaeological societies which, under the umbrella of the Council for British Archaeology, put pressure on the national Government to identify more industrial heritage sites for protection. Public opinion, outraged by the needless demolition of the Euston Arch in 1962, galvanised Government ministries to fund a National Survey of Industrial Monuments in 1963 to be managed by the CBA.

Then from 1964 to 1970 a series of CBA Conferences took place in Bath, and after 1970 the Conference was taken to other locations, with the 1973 Conference held on the Isle of Man. The 50+ delegates at this Conference established the Association for Industrial Archaeology, with Tom Rolt as Chairman, Angus Buchanan as Vice-Chairman, and Neil Cossons as Secretary.

The AIA's aims as stated in September 1973 at the Isle of Man Conference, though slightly amplified, hold good today. These were to promote the study of industrial archaeology and to encourage improved standards of recording, research and specialist survey and research groups; to encourage bodies involved in the preservation of industrial monuments; to represent the interests of industrial archaeology at a national level; to hold conferences and seminars; and to publish the results of research.

Chris then went through each of these goals and explained how the AIA fulfilled each of them, and had amplified several in the process. In terms of promoting recording and research, the AIA now has a number of Awards - for outstanding scholarship and for digital initiative; for archaeological reports; for university dissertations; for publications; as well as for student bursaries and travel

bursaries. At a national level, the AIA has an industrial heritage support officer, and the All Parliamentary Party Group on Industrial heritage was formed in 2013 to champion the industrial heritage sector at Westminster.

Perhaps the most familiar ingredient of the AIA's work is the Annual Conference, held in a different location in the UK each year, and Chris showed the geographical spread of these Conferences (with Warwickshire a conspicuous absentee!). He then went on to report on this year's conference at Telford.

These Conferences always include tours to sites in the area, often giving access not normally available to the general public. Visits included Apley Estate Farm, the Clee Hills Industrial Landscape, Thomas Telford's Roads and Canals, Birmingham Jewellery Quarter, the Museum of Carpet at Kidderminster, Burleigh pottery, Middleport, and Ditherington Flaxmill in Shrewsbury, all reflecting the wide range of interests of the industrial archaeologist. Chris had particularly enjoyed the visit to the Aga Rangemaster Foundry at Coalbrookdale (with its Leamington connection) and showed a series of slides of the various stages in the foundry process.

The AIA also organizes one day seminars to showcase and explore a topical issue.

This year the subject was - 'What has World Heritage Site Inscription done for Britain's Industrial Heritage?' The UK has 26 World heritage Sites, and 9 of these have industrial heritage interest - Ironbridge Gorge; The Cornwall and West Devon Mining Landscape; Saltaire; The Pontcysyllte Aqueduct; Liverpool Docks; New Lanark; Derwent Valley Mills; Blaenavon; and The Forth Bridge.

In terms of publications, the *IA Review* is the AIA House Journal. It has changed publishers, title and format several times but it has been a continuous series with an illustrious pedigree and high levels of scholarship maintained throughout. The *IA News* is the Quarterly Newsletter, which started life in March 1974, with the next edition No. 179. Chris does a very fine job as editor of this Newsletter, and he was delighted to announce that this latest edition will be in full colour.

In addition to the five original aims of AIA, it has been possible to add a sixth goal. This is to support the restoration of industrial sites and artefacts. This was an initiative launched in 2009, with a total of over £400,000 allocated since then. Chris then went through a number of examples of such Restoration Grants, from the Salt Wagon at the Lion Salt Works in Cheshire to the Gas House at Hackney. From 2015 an additional award was also added for the Best Creative Re-use of an Industrial Building, with illustrations of the most recent recipients.

So there is more to the AIA than meets the eye, and Chris concluded with a re-emphasis on the threats posed to our industrial heritage, citing the example of the closed and demolished Snibston Discovery Museum in Leicestershire, with many direct and indirect costs of closure, including employment in the local community. The ambitious plans for Ditherington Flaxmill show what can be done, and Chris added the example of the imaginative museum use of the Volklingen Ironworks in Saarland to illustrate this further.

WIAS is one of 50+ societies affiliated to the AIA, but this did not prevent individuals from becoming members and adding to the crusade for the preservation of our industrial heritage. Chris had indeed presented a convincing case for such support.

December 2016: Alain Foote:*The Kempton Great Engines.*

Situated alongside an elevated section of the A316 near to Kempton Park racecourse is a national monument to the last days of the steam age. Alain Foote knew it well from his schooldays and brought its history to life in another meticulously researched presentation.

The story begins in the early 17th century with the development of London's water supply and the proposal for the New River Head at Highbury. By 1850, London's water supply was in crisis due to cholera outbreaks. Parliament forced the water companies to move their intakes to above Teddington Lock and to filter the water.

Later, in 1897, the New River Company created the Kempton Water Treatment Works on the SW outskirts of London.

The original engine house contained 5 triple expansion engines built by Lilleshall. Two lifted water into the reservoirs from the Thames and three pumped clean water to Finsbury and Cricklewood.

From 1920, the Metropolitan Water Board (which had acquired the New River Company in 1904) began planning increases in capacity at Kempton. As part of this capacity increase, a new Engine House was constructed to house two additional triple expansion engines.

Contemporary photographs and copies of the original plans for the new engine house provided the background and an indication of the scale of the enterprise. Construction of the new engine house began in 1926. The outside is faced with red Southwater bricks and Portland stone dressings. The walls are 8ft thick. The two chimneys stand 135ft high. The first chimney was built to serve the Lilleshall engines, the second to serve the the new ones.

The two triple expansion engines were built by Worthington Simpson in Newark. Partially assembled in the factory they were then stripped down and sent by rail to Kempton and rebuilt. The scale of these engines is difficult to imagine but one photograph of the lower part of one under construction includes a man who is dwarfed by it.

The engines are believed to be the largest of their kind in Britain. Designed for 24-hour 7 days a week operation they ran for 52 years between 1928 & 1980.

The engine house was designed for three engines but only two were built and a steam turbine subsequently took the place of the third. Recent photographs clearly showed the scrupulous cleanliness that was maintained throughout. The entire building is lined with glazed bricks whilst the two floor levels are quarry tiled with patterns of black & white tiles giving an art deco effect. Its impressive scale has found favour over the years as a film location for such diverse productions as Titanic, episodes of Poirot and several children's programmes.

The plant stopped working in 1980 and English Heritage declared it a National Monument and, along with its contents, was listed Grade II*. In 1995, the Kempton Great Engines Trust was formed with the aim of restoring and maintaining this piece of steam heritage. The first task was to remove large quantities of asbestos lagging with grateful thanks to Thames Water for footing the bill. Then volunteers spent the following six years restoring one of the engines before Prince Charles was invited to restart

it in 2002. The first public steaming weekend took place in October 2004.

Turning to the technical details of the inverted triple expansion engines, Alain used photographs and animated graphics to describe the operating principles and the many unique features. The statistics speak for themselves; Height of the engine and pumps is 62ft 6in, Length 45ft, Weight some 800 tons, Power 1008 hp, Speed 25.4 rpm max, Steam conditions 200 psig with 150 deg F of superheat, Steam Consumption 9.875 lbs per pump HP per hour, Flywheel diameter 17ft, Flywheel weight 32 tons each. The pumps delivered some 19 million gallons of water a day or 520 gallons for every revolution.

One important feature was the emergency shutdown system. The engines pumped water directly into the pressure main, if the mains pressure dropped (e.g. due to a fractured main) the engine would speed up out of control. The shutdown system prevents this from happening. A spring loaded valve downstream of the steam inlet valve is kept open by pressure from the water main whilst a vacuum breaker valve on the exhaust line is kept closed by pressure from the water main. In the event of loss of mains pressure the inlet valve closes and the vacuum breaker valve opens rapidly bringing the engine to standstill. This system can also be operated by a lever at the driving position.

The illustrations of the various mechanical features all demonstrated the monumental scale of the machinery. Although huge, every aspect could be related to equipment of more modest size. A triumph of upscaling that really worked.

A small twin cylinder barring engine is located adjacent to each flywheel. They are used to turn the main engine through sufficient revs to get steam through all three cylinders & build up a vacuum in the condenser. At this stage the main engine will start and automatically throw the barring engine out of gear as it accelerates.

The condenser is a cast iron horizontal shell and tube heat exchanger 13ft long and 5ft diameter with 655 brass tubes giving a surface area of 1700 sq ft arranged in three passes. The exhaust steam passes through the tubes and is condensed whilst two vertical reciprocating air pumps are directly driven from the bottom crosshead of the LP Pump.

The bearing oil system is gravity fed using mineral oil which is pumped from the basement to the head tanks. Oil from the upper head tank flows by gravity to oil distributors on the top gallery to feed the top valve gear and from the lower head tank to oil distributors on the middle gallery to feed the bottom valve gear and all engine and camshaft lubrication points. The cylinder oil system is force fed using heavy grade steam oil with injector pumps for each cylinder.

Steam was originally provided by six Babcock & Wilcox Boilers and 1945 two John Thompson Boilers were added. Today the much lower demands are met by a Cochrane 'Wee Chieftain' boiler.

These engines represent the pinnacle of reciprocating steam engine development and well worth seeing. For members with a head for heights Alain is planning a Society visit but regular monthly steaming days between March and November are open to visitors.